

What is claimed is:

- 1 1. A method for improving transmission control protocol
2 (TCP) performance of a communication network having a
3 receiver receiving a plurality of packets each having a
4 header including an address and a sequence number,
5 comprising:
 - 6 (a) identifying a first packet, from the plurality
7 of packets, having a bit error;
 - 8 (b) marking the first packet as having been received
9 with a bit error;
 - 10 (c) passing the marked first packet to the software
11 protocol; and
 - 12 (d) sending, if all packets for a window size are
13 received, a selective acknowledgment indicating
14 the bit error while suppressing duplicate
15 acknowledgments.
- 1 2. The method of claim 1, further comprising:
 - 2 (e) constructing the selective acknowledgment having
3 a plurality of acknowledgment bits, each
4 acknowledgment bit corresponding to packets for
5 the window size, said constructing step (e)
6 being performed before said sending step (d).
- 1 3. The method of claim 2, wherein said constructing step
2 including the substeps of:
 - 3 (i) assigning, for each packet for the window size
4 from the plurality of packets marked in step (b)
5 as received with a bit error, an error value to

6 a corresponding acknowledgment bit from the
7 plurality of acknowledgment bits; and
8 (ii) assigning, for each packet for the window size
9 from the plurality of packets not marked in step
10 (b) as received with a bit error, a no-error
11 value to a corresponding acknowledgment bit from
12 the plurality of acknowledgment bits.

1 4. The method of claim 2, wherein said constructing step
2 including the substeps of:

3 (i) assigning, for each packet for the window size
4 from the plurality of packets marked in step (b)
5 as received with a bit error, an error value to
6 a corresponding acknowledgment bit from the
7 plurality of acknowledgment bits;
8 (ii) assigning, for each packet for the window size
9 from the plurality of packets not marked in step
10 (b) as received with a bit error, a no-error
11 value to a corresponding acknowledgment bit from
12 the plurality of acknowledgment bits; and
13 (iii) assigning, for each packet for the window size
14 not received, the error value to a corresponding
15 acknowledgment bit from the plurality of
16 acknowledgment bits.

1 5. The method of claim 1, further comprising:

2 (e) sending, if all packets for a window size are
3 not received, duplicate selective
4 acknowledgments.

1 6. In a method for controlling transmission
2 performance of a communication network having a base
3 station relaying a plurality of packets each having a
4 payload and a header including an address and a sequence
5 number to a receiver, an improvement comprising:

6 (a) adding a plurality of error correction bits to
7 each packet header without adding error
8 correction bits to each packet payload.

1 7. The improvement of claim 6, wherein step (a) is
2 performed at the base station.

1 8. The improvement of claim 6, further comprising:

2 (b) identifying a first packet, from the plurality
3 of packets, having a bit error;

4 (c) determining whether the bit error occurs within
5 the packet header of the first packet; and

6 (d) correcting the bit error if the bit error is
7 within the packet header of the first packet.

1 9. The improvement of claim 6, further comprising:

2 (b) identifying a first packet, from the plurality
3 of packets, having a bit error;

4 (c) determining whether the bit error occurs within
5 the packet header of the first packet;

6 (d) correcting the bit error if the bit error is
7 within the packet header of the first packet;
8 and

9 (e) flushing the first packet if the bit error
10 corrected in said correcting step (d) is within
11 the source address.

1 10. The improvement of claim 6, further comprising:
2 (b) identifying a first packet, from the plurality
3 of packets, having a bit error;
4 (c) determining whether the bit error occurs within
5 the packet header of the first packet;
6 (d) marking the first packet as received in error if
7 the bit error does not occur within the packet
8 header of the first based on said determining
9 step (c).

1 11. The improvement of claim 6, further comprising:
2 (b) identifying a first packet, from the plurality
3 of packets, having a bit error;
4 (c) determining whether the bit error occurs within
5 the packet header of the first packet;
6 (d) correcting the bit error if the bit error is
7 within the packet header of the first packet;
8 (e) flushing the first packet if the bit error
9 corrected in said correcting step (d) is within
10 the source address; and
11 (f) marking the first packet as received in error if
12 the bit error does not occur within the packet
13 header of the first based on said determining
14 step (c).

1 12. A system for sending and receiving a plurality
2 packets of information over a lossy link, each packet
3 having a header containing an address and a sequence
4 number, within a communication network, comprising:

5 a base station connected to the communication
6 network; and

7 a receiver connected to the base station over the
8 lossy link, said receiver receiving a plurality of packets
9 from said base station, said receiver distinguishing for
10 a first packet from the plurality of packets an error from
11 the group of a non-congestion bit error and a congestion
12 error, said receiver sending when the first packet has
13 non-congestion bit error a selective acknowledgment
14 indicating the first packet being received with non-
15 congestion bit error while suppressing duplicate
16 acknowledgments.

1 13. The system of claim 12, wherein said base station
2 adds a plurality of error correction bits to each packet
3 header.